

Claims

1. A method for preparing a substrate to receive a ceramic coating including the steps of:

removing material from the surface at a progressively decreasing rate.

- 5 2. A method as in Claim 1 in which the material is removed by abrasion and which includes at least two abrasion steps and wherein the first step removes material at a rate which is at least twice the rate of the last abrasion step.
3. A method as in Claim 1 in which an abrasion process of decreasing intensity is employed.
- 10 4. A method as in Claim 2 which includes at least three abrasion steps of progressively reducing intensity.
5. A method as in Claim 1 wherein the abrasion is caused by oxide ceramic abrasive particles.
6. A method as in Claim 1 wherein the abrasion is caused by grit blasting.
- 15 7. A method as in Claim 1 wherein the surface has a bond coat.
8. A method as in Claim 1 wherein the surface has a bond coat which is an MCrAlY coating.
9. A method as in Claim 6 wherein the bond coat is an MCrAlY bond coat which has been applied by a method selected from the group consisting of EBPVD, cathodic arc deposition, plasma spray deposition, electroplating, and sputtering.
- 20 10. A method as in Claim 1 in which a diffusion heat treatment is performed prior to the progressively decreasing rate material removal process step.

11. A method as in Claim 1 in which an ultrasonic cleaning step is performed subsequent to the progressively decreasing rate material removal process step.

12. A method as in Claim 10 in which a surface peening operation is performed subsequent to the diffusion heat treatment step.

5 13. A method for applying a ceramic thermal barrier coating to a metallic substrate including the steps of:

a) applying an MCrAlY bond coat to the substrate using a cathodic arc
deposition process

b) diffusion heat treating the coated substrate

c) peening the diffusion heat treated coated substrate

d) abrasively removing material from the bond coat at a progressively reducing
rate

e) ultrasonically cleaning the abrasively treated bond coat

f) applying a ceramic coating.

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14. A method as in Claim 13 wherein the abrasive removal process is performed using oxide ceramic abrasive materials.

15. A method as in Claim 13 wherein the abrasive removal process occurs at an initial rate which is at least twice as great as the rate of removal at the end of the abrasive removal process.

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16. A process as in Claim 13 wherein the peening is performed to an intensity of from 13-17 N on the Almen scale.

17. A process as in Claim 13 wherein the diffusion heat treatment is performed at a temperature of from about 1800° to about 2100°F for a time of from about .5 to about 10 hours.

- [illegible]